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| 09/872,937 | 06/02/2001 | Ravi Chandra | 4906.P022 | 3281 |
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| BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030 | | | BULLOCK JR, LEWIS ALEXANDER | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2195 | |

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|--|---------------------------------------|
| Office Action Summary | Application No. 09/872,937 | Applicant(s) CHANDRA ET AL. |
| | Examiner Lewis A. Bullock, Jr. | Art Unit 2195 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on response filed 12/23/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 and 40-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 and 40-58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-34 and 40-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over KIDDER (U.S. Patent 6,694,450) in view of Applicant's Admitted Prior Art (APA).

As to claim 1, KIDDER teaches a computer implemented method comprising: determining, by a process state manager (name server), a process state (started / failed / restarted) (via the name server); and indicating from the process state manager (name server) to a plurality of processes (high level processes / device driver / applications) changes in the process state (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35). However, KIDDER does not teach that the determination includes determining expiration of a time period to receive a heartbeat message when the process dies.

APA teaches a method for determining expiration of a time period for receiving a heartbeat message in order to determine if a process has died (pgs. 2-3, paragraph 0004). It would be obvious to one of ordinary skill in the art that the name server of KIDDLER receives the heartbeat messages as disclosed in the APA to determine if the process has failed, i.e. has died, since it is determined if a terminated process does not

Art Unit: 2195

re-register within a predetermined amount of time, the name server may then notify the subscriber processes of the termination of the failed process (col. 23, lines 32-35).

Therefore, it would be obvious to one skilled in the art to combine the teachings of KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process.

As to claim 6, KIDDER teaches a computer implemented method performed by a process state manager (name server) comprising: registering interest of a first process (process / device driver / application) in a second process (process / device driver / application); determining the second process state (started / failed / restarted) (via the name server); and notifying the first process when the second process changes state (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35). However, KIDDER does not teach the process state is determined by processing a heartbeat from the second process.

APA teaches a method for determining expiration of a time period for receiving a heartbeat message in order to determine if a process has died (pgs. 2-3, paragraph 0004). It would be obvious to one of ordinary skill in the art that the name server of KIDDLER receives the heartbeat messages as disclosed in the APA to determine if the process has failed, i.e. has died, since it is determined if a terminated process does not re-register within a predetermined amount of time, the name server may then notify the subscriber processes of the termination of the failed process (col. 23, lines 32-35). Therefore, it would be obvious to one skilled in the art to combine the teachings of

Art Unit: 2195

KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process.

As to claim 11, KIDDER teaches a computer implemented method comprising: determining a first process (process / device driver / application) has started (via the process registering with the name server); providing the first process a communication key (process identification information); maintaining (via the name server) the communication key (process identification information) and the first process state (started / failed / restarted) and transmitting the communication key (process identification information) to a second process (process /device driver / application) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 19, lines 29-38). However, KIDDER does not teach that the process state is based on a heartbeat of the first process.

APA teaches a method for determining expiration of a time period for receiving a heartbeat message in order to determine if a process has died (pgs. 2-3, paragraph 0004). It would be obvious to one of ordinary skill in the art that the name server of KIDDLER receives the heartbeat messages as disclosed in the APA to determine if the process has failed, i.e. has died, since it is determined if a terminated process does not re-register within a predetermined amount of time, the name server may then notify the subscriber processes of the termination of the failed process (col. 23, lines 32-35). Therefore, it would be obvious to one skilled in the art to combine the teachings of

Art Unit: 2195

KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process.

As to claim 17, KIDDER teaches a computer implemented method comprising: receiving a request for a communication key (process identification information) of a first process (process / device driver / application) from a second process (process / device driver / application); determining the first process state (started / failed / restarted) (via the name server); if the first process is alive (started), then transmitting the communication key (process identification information) for the first process to the second process; if the first process has not started (failed), then indicating to the second process the communication key (process identification information) is not available (indicate that process has failed); receiving a message when the first process starts (process registering with name server); providing the communication key (process identification information) to the first process (col. 22, lines 14-25); and transmitting the communication key (process identification information) to the second process (via process requesting for number) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35). However, KIDDER does not teach determining whether a process is alive by receipt of a heartbeat message prior to expiration of a timer.

APA teaches a method for determining expiration of a time period for receiving a heartbeat message in order to determine if a process has died (pgs. 2-3, paragraph 0004). It would be obvious to one of ordinary skill in the art that the name server of

KIDDLER receives the heartbeat messages as disclosed in the APA to determine if the process has failed, i.e. has died, since it is determined if a terminated process does not re-register within a predetermined amount of time, the name server may then notify the subscriber processes of the termination of the failed process (col. 23, lines 32-35).

Therefore, it would be obvious to one skilled in the art to combine the teachings of KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process.

As to claim 23, KIDDER teaches an apparatus comprising: a processor (board / central processor) to execute a process state manager (name server), a first process (process / device driver / application), and a second process (process / device driver / application), the process state manager (name server) to maintain a first communication key (process identification information) for the first process and a second communication key (process identification information) for the second process and to communicate state changes (failed / started / restarted) between the first process and the second process; and a memory coupled to the processor, the memory (via memory subsystem) to store a first state for the first process and a second state for the second process, the first communication key and the second communication key (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39). However, KIDDER does not teach determining state changes

Art Unit: 2195

based at least in part on a first heartbeat of the first process and a second heartbeat of the second process.

APA teaches a method for determining expiration of a time period for receiving a heartbeat message in order to determine if a process has died (pgs. 2-3, paragraph 0004). It would be obvious to one of ordinary skill in the art that the name server of KIDDLER receives the heartbeat messages as disclosed in the APA to determine if the process (es) has failed, i.e. has died, since it is determined if a terminated process does not re-register within a predetermined amount of time, the name server may then notify the subscriber processes of the termination of the failed process (col. 23, lines 32-35). Therefore, it would be obvious to one skilled in the art to combine the teachings of KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process.

As to claim 27, KIDDER teaches an apparatus comprising: a first processor (board / central processor) to host a process state manager (name server), the process state manager to maintain a communication key (process identification information) and a state (failed / started / restarted) for a process (process / device driver / application); and a second processor (another board / another central processor) coupled to the first processor, the second processor to host the process (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35). KIDDLER also teaches that the name server manages the state of the processes (failed / started /

Art Unit: 2195

restarted). However, KIDDLER does not teach that the process periodically transmits heartbeat messages to the state manager.

APA teaches a process periodically sends a heartbeat message and when it doesn't the process is determined to be died (pgs. 2-3, paragraph 0004). It would be obvious that the name server of KIDDLER receives the heartbeat messages as disclosed in the APA to determine if the process has failed, i.e that the process has died, since it is determined if a terminated process does not re-register within a predetermined amount of time, the name server may then notify the subscriber processes of the termination of the failed process (col. 23, lines 32-35). Therefore, it would be obvious to one skilled in the art to combine the teachings of KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process.

As to claim 31, reference is made to a machine-readable medium that corresponds to the method of claim 17 and is therefore met by the rejection to claim 17. However, claim 31, further details receiving the first communication key; transmitting signals to the process state manager; and if the communication key is not provided, then requesting notification from the process state manager when the second communication key is available. KIDDER teaches receiving the first communication key (process identification information); transmitting signals (states / failed / started / restarted) to the process state manager (name server); and if the communication key (process identification information) is not provided, then requesting notification from the

Art Unit: 2195

process state manager (name server) when the communication key is available (register interest) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39; col. 19, lines 29-37).

As to claim 2, KIDDER teaches receiving a request for a communication key when the process starts and restarts (register interest / request connection) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39; col. 19, lines 29-37). However, KIDDER does not teach determining expiration of a time period for receiving a heartbeat message when the process dies.

As to claims 3, 15 and 20, KIDDER teaches registering interest of the plurality of processes (process / device driver / application) in any of the processes (process / device driver / application) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39)

As to claim 4, KIDDER teaches managing a plurality of communication keys (processes identification information) for the processes (via the name server) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claims 5, 10, 16 and 22, KIDDER teaches the plurality of processes (process / device driver / application) communicating with any of the processes with a communication key (process identification information) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claim 7, KIDDER teaches the process state is either alive (started / restarted) or dead (failed) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claims 8, 21, and 34, KIDDER teaches transmitting a death notification when the process dies (notification that process failed); and transmitting a birth notification when the process starts or restarts (notification of newly assigned process identification number) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claim 9, KIDDER teaches providing the second process (process / device driver / application) a communication key (process identification information) when the second process starts (starts / restarts); and transmitting the communication key (process identification information) to the first process (via notify the process of the identification number or providing the identification number to the process) (col. 20, line

Art Unit: 2195

36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claim 12, KIDDER teaches receiving a request for a communication key when the process starts and restarts (register interest / request connection) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39; col. 19, lines 29-37).

As to claims 13, 18, 24, 28 and 32, KIDDER teaches the communication key (process identification information) includes a process identifier (process name) and an incarnation identifier (process identification number) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claims 14, 19 and 26, KIDDER teaches maintaining the communication key (process identification information) comprises creating a unique process identifier (process name) when the first process initially starts and updating an incarnation identifier part (process identification number) of the communication key each time the first process restarts (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claims 25, 29, 30, and 33, KIDDER teaches a first and second processor (board / central processors) to execute a plurality of processes (processes / device drivers / applications), the processes to communicate with the first process (a particular process / device driver / application) and to register, i.e. request a communication key (process identification information), with the process state manager (name server) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

As to claims 40-44, reference is made to a machine-readable medium that corresponds to the method of claims 6-10 and is therefore met by the rejection of claims 6-10 above.

As to claims 45-50, reference is made to a machine-readable medium that corresponds to the method of claims 11-16 and is therefore met by the rejection of claims 11-16 above.

As to claims 51-56, reference is made to a machine-readable medium that corresponds to the method of claims 17-22 and is therefore met by the rejection of claims 17-22 above.

As to claim 28, refer to claim 13 for rejection.

As to claims 29 and 30, refer to claim 25 for rejection.

As to claim 57, KIDDER teaches a network apparatus, comprising: a plurality of network processes (processes / device drivers), including a BGP process, each of the plurality of network processes to, generate a registration request message (message registering with name server) upon birth (started), receive communication keys (process identification number) for direct communication between the plurality of network processes (col. 20, lines 55-64), express interest in other ones of the plurality of network processes (via high level processes to subscribe for information about objects with which they need to communicate) (col. 20, lines 36-50), and a configuration manager (name server) to, register each of the plurality of network processes responsive to each of the registration request messages (message sent by process to register for interest), provide the communication keys to the plurality of network processes (interested processes), record the expressed interest of the plurality of network processes in other ones of the plurality of network processes, detect each of, birth of any of the plurality of network processes based on the registration request messages (message registering started process), death of any of the plurality of network processes (message indicating termination of process), and restart of any of the plurality of network processes that previously registered based on a completion signal from the network process indicating that it has restarted (message indicating restart of a process), and notify, upon detection of birth, death and/or restart of any of the plurality of network processes, those of the

Art Unit: 2195

other of the plurality to network processes that expressed interest (wherein the name server notifies registered process, of the interested state change of particular processes) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35). However, KIDDER does not teach the processes generate periodic heartbeat messages while active and detecting death based on the absence of the heartbeat messages.

APA teaches a method wherein processes send heartbeat messages and determining expiration of a time period for receiving a heartbeat message in order to determine if a process has died (pgs. 2-3, paragraph 0004). It would be obvious to one of ordinary skill in the art that the name server of KIDDLER receives the heartbeat messages as disclosed in the APA to determine if the process has failed, i.e. has died, since it is determined if a terminated process does not re-register within a predetermined amount of time, the name server may then notify the subscriber processes of the termination of the failed process (col. 23, lines 32-35). Therefore, it would be obvious to one skilled in the art to combine the teachings of KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process.

As to claim 58, KIDDER teaches the communication key (process identification information) includes a process identifier (process name) and an incarnation identifier (process identification number) and the configuration manager updating an incarnation identifier part (process identification number) of the communication key each time the

Art Unit: 2195

first process restarts (name server) (col. 20, line 36 – col. 21, line 9; col. 21, lines 42-53; col. 21, line 61 – col. 22, line 8; col. 23, lines 11-35; col. 7, lines 7-39).

Response to Arguments

3. Applicant's arguments filed 12/23/04 have been fully considered but they are not persuasive. Applicant argues that there is no suggestion to combine the teachings of KIDDER with the teachings of Applicant's Admitted Prior Art. Applicant bases this decision on a recitation in Kidder wherein a "Master Control Driver (MCD) that learns the physical characteristics by taking "physical inventories to determine if hardware has been added or removed from a computer system" (col. 12, lines 65-66). The examiner disagrees. The examiner has mapped the name server to the state manager. The name server does not poll the processes thereby wasting time and resources (col. 20, lines 13-35). The name server allows high level processes to register information about the objects within them and to subscribe for information about the objects with which they need to communicate (col. 20, lines 36-41). The device drivers, e.g. the processes, register when they are started or failed with the name server and the name server provides this information to the registered interested process (col. 20, line 55 – col. 21, line 9). The name server gives the registered interested process the identification number of the process so that the registered process can communicate with the registered process (col. 21, lines 26-41; col. 21, lines 61-67). Applicant's admitted prior art teaches a well known method of IPC utilizes heartbeat messaging between processes wherein the processes periodically transmit heartbeat messages or

Art Unit: 2195

signals indicating that they are alive and running within a given time period (pg. 2-3, paragraph 0004). Therefore based on the combination, the processes would send heartbeat messages to the name server such that the name server is able to determine whether the process is alive, dead, or restarted, since the name server normally receives messages from processes regarding the process state. Therefore, it would be obvious to one skilled in the art to combine the teachings of KIDDER with the well known teachings of heartbeat messaging in order to dynamically determine the state of a process. The cited references are analogous to one another because neither reference polls a process, but responds to messaging of the processes to determine the state of a process.

Therefore, since the prior art of record adequately teaches all the limitations of the claims, the claims are rejected as disclosed above.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2195

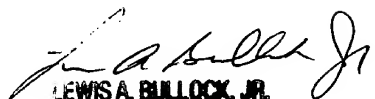
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lewis A. Bullock, Jr. whose telephone number is (571) 272-3759. The examiner can normally be reached on Monday-Friday, 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 15, 2005


LEWIS A. BULLOCK, JR.
PRIMARY EXAMINER